

V650 - New insights into cryo balloon pulmonary vein isolation in AF by online PV potential recording with a new circular mapping catheter

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Cryo balloon catheter ablation is a new promising technique for circumferential isolation of pulmonary veins (PV). The aim of this study was to test the feasibility and safety of a new circular mapping catheter placed in the pulmonary vein through the lumen of the cryo balloon for online PV potential recording during ablation. Online electrophysiological information was analysed to identify predictors for successful PV isolation.

Cryo balloon PV isolation with simultaneous PV potential recording was performed in 81 consecutive patients. A 6-pole mapping catheter with a shaft diameter of 0.035 in. was advanced through the lumen of the cryo balloon catheter for online recording of pulmonary vein conduction during cryo application. PV potentials were recorded by six electrodes mounted on a circular ring (diameter 15mm) at the distal end of the catheter.

Balloon positioning and ablation with the mapping catheter was achieved in 231/322 veins (72%). Ablation and online PV potential recordings could be obtained in 140/322 veins (44%). The acute success was 99% with PV isolation in 320/322 veins. PV isolation required a mean of 11 ± 3 cryoablations per patient and a mean of 1.7 ± 1.3 applications per vein. Of the 140 veins with online PV potential recording 19 (14%) showed reconnection during the procedure, in 121 veins (86%) no reconnection occurred. In veins without reconnection PV isolation was achieved at a median ablation time of only 42sec, whereas PV isolation was observed significantly later in veins with reconnection at a median ablation time of 168sec ($p \leq 0.001$). ROC curve analysis showed that a time to PV isolation cutoff value of 82sec was highly predictive for a stable PV isolation without reconnection.

The new circular mapping catheter is feasible and safe for online monitoring of PV conduction with immediate assessment of PV isolation. However, catheter re-design is necessary for optimized positioning. A time to PVI cutoff-value of 82 could be identified as the best predictor for a stable procedural PV isolation without reconnection. Follow-up has to show, whether this is also predictive for long-term success.

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